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PROGRESS

of the

Barberry Eradication Campaign

in

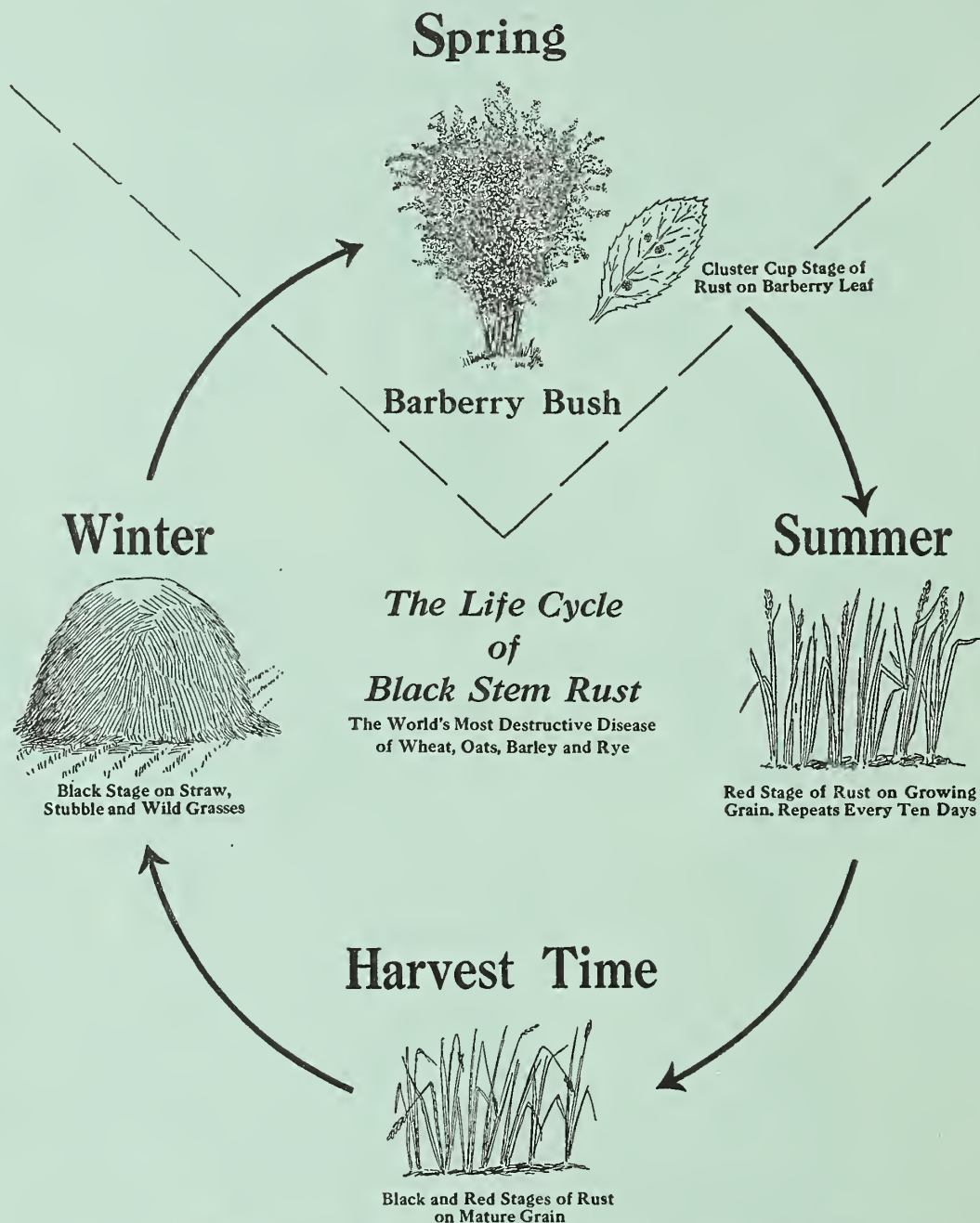
Iowa in 1930



*Black Stem Rust Spread From This Common Barberry Bush
To Near-by Grain Fields Causing Severe Damage*

Barberry Eradication Pays

Remove the Barberry and Break the Rust Cycle



All Common Barberries act as starting points for Black Stem Rust early each spring. By destroying the barberry the early spring source of black stem rust is eliminated. The Common Barberry provides a means to bridge the gap between the black stage on grain in the fall and the red stage of the rust on grains and grasses the following spring.

BOOST BARBERRY ERADICATION—A PRACTICAL RUST CONTROL MEASURE

PROGRESS OF THE BARBERRY ERADICATION CAMPAIGN

IN IOWA, 1930

By D. R. Shephard*, Agent,

Office of Barberry Eradication, Bureau of Plant Industry

United States Department of Agriculture.

INTRODUCTION

The barberry eradication campaign in the 13 North-Central cooperating States was begun in 1918 by the United States Department of Agriculture in an effort to reduce the annual loss suffered in this area from epidemics of black stem rust. Stem rust was becoming a severe menace to the small grain crops in these States. In some areas the production of certain small grains was discontinued because of the grower's inability to contend with this dreaded disease. A control measure was imperative. Since the advent of this important work more than eighteen million bushes have been destroyed in the 13 North-Central grain-growing States. During this same time the losses suffered each year from black stem rust have shown a decided decline.

The destruction of the harmful barberry has not alone been responsible for the reduction of the annual black stem rust loss. The breeding of rust resistant varieties of grain, and certain cultural practices have played an important role. However, it is believed that barberry eradication has been the most important factor in bringing about the reduction of stem rust losses.

It is not hard to imagine the problem that we would be facing today if these eighteen million barberries had not been destroyed but were still scattered over these 13 States, producing thousands of seeds each year, and initiating black stem rust epidemics each spring. In Iowa alone during this period 1,050,247 bushes and seedlings have been destroyed. Iowa farmers in 1929 produced approximately 335,000,000 bushels of wheat, oats, barley and rye, all of which are subject to the attack of black stem rust. These crops furnished a considerable part of their annual income either through direct sale, or indirectly through feeding to livestock. Every effort must be made to protect these important crops against this destructive plant disease.

*Leader of Barberry Eradication in Iowa.

ALL KNOWN MEANS OF CONTROL MUST BE EMPLOYED

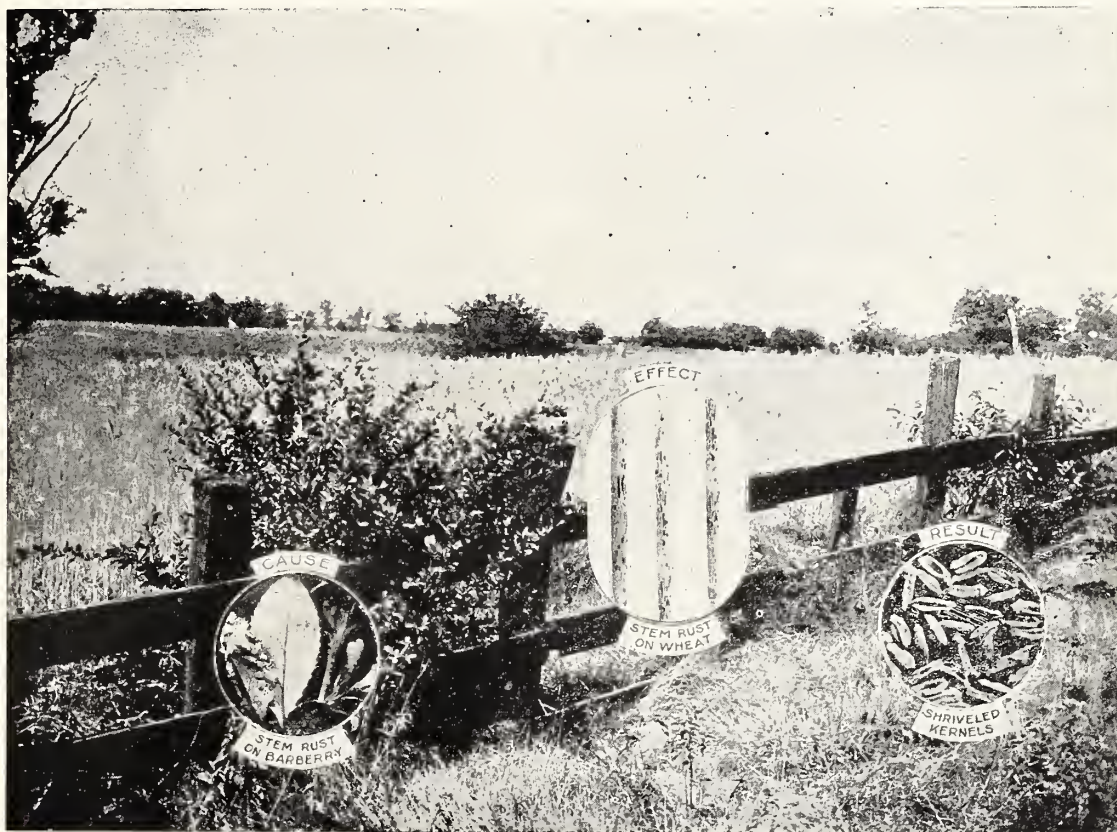
The elimination of the common barberry as the alternate host of black stem rust is one of the most important control measures for this disease. Each spring the tiny seed or spore that is responsible for the early rust infection in Iowa must start its growth on this shrub. Years of intensive research have convinced plant disease specialists that this little seed-like spore cannot grow on any shrub other than the common barberry. The elimination of this spring host plant will thus break up the life cycle of the rust and prevent it from developing in Iowa. Only a few barberries growing in a community may be responsible for a serious stem rust epidemic. Once started in the spring, the rust is no longer dependent upon the barberry for its spread. These tiny spores reproduce on the grain and spread from one stem to another, from one field to another and eventually from one community to another. This makes a regional problem of the campaign.

There are certain varieties of wheat, oats, barley, and rye on the market that are more resistant to stem rust than others. Plant breeders are working all the time to find new varieties that are less susceptible to this disease. However, the plant breeder can accomplish much more by way of introducing resistant varieties of small grain after all of the barberries have been destroyed. Recent discoveries made by the Canadian Rust Research Laboratories at Winnipeg and by Dr. E. C. Stakman and his co-workers at the University of Minnesota, each working independently show that entirely new strains of stem rust are produced if two different forms of rust cross-breed on barberry leaves. The knowledge that new forms of this disease may appear suddenly, makes evident the necessity of destroying this harmful shrub. The barberry is the only shrub on which this cross-breeding can occur in nature.

The sowing of early-maturing varieties of grain and the early sowing of all varieties are recommended as a further means of preventing excessive loss from black stem rust.

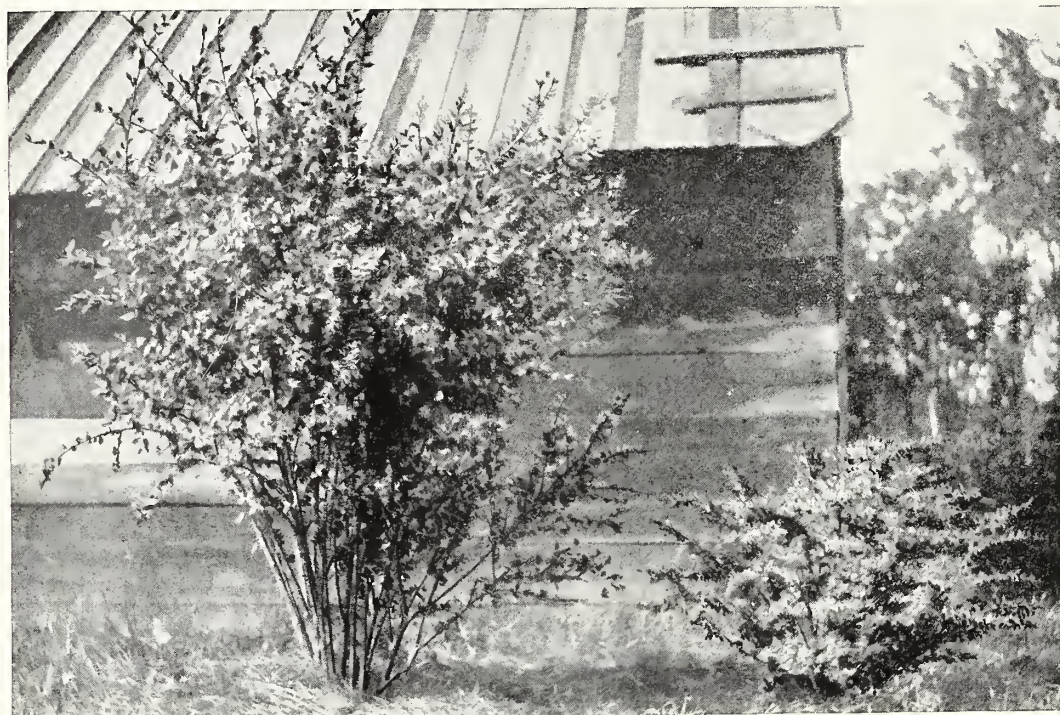
Black Stem Rust

spreads from Common Barberry Bushes to Wheat, Oats, Barley, Rye and many Grasses



Black stem rust of small grains is caused by a tiny parasitic plant. In the Northern States it lives for a time each spring on the leaves of common barberry bushes. The dust-like spores of the rust are spread by the wind for miles from barberry bushes to grain fields and from one grain field to another. Warm, moist weather aids the rapid development and spread of stem rust, just as the growth of corn, wheat, or other crops is affected by favorable weather conditions. Destroy common barberry bushes and reduce losses from stem rust.

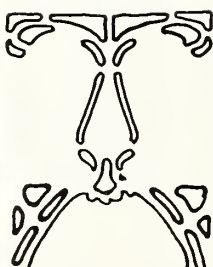
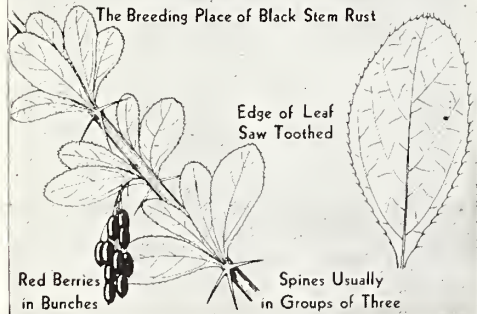
Learn to Know Common Barberry



COMMON BARBERRY

HARMFUL

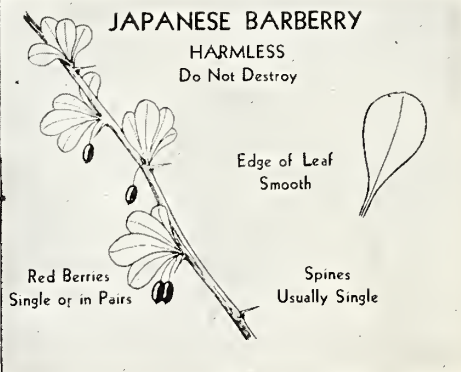
The Breeding Place of Black Stem Rust



JAPANESE BARBERRY

HARMLESS

Do Not Destroy



Report common barberry bushes you may find, to the Barberry Eradication Office in your State, your Agricultural College, your State Department of Agriculture, or the Barberry Eradication Office, United States Department of Agriculture, Washington, D.C.

PHASES OF THE CAMPAIGN

The barberry eradication work in Iowa has developed along three distinct lines: (1) Survey and eradication, (2) Education and publicity, (3) Investigation.

The program of survey and eradication consists of a property-to-property inspection of all rural and city properties in the State of Iowa. On this inspection all natural and planted timber as well as all fence rows must be thoroughly searched. The first survey was completed in Iowa in 1922 and was conducted hurriedly with the idea of destroying the largest number of bushes in the shortest period of time. Because of the hurried nature of this first survey, bushes growing in out-of-the-way places were missed. The second survey is now being carried on to find bushes that were missed during this first survey and those which have grown from seeds lying in the ground at the time of the first survey. Some counties where areas of escaped bushes were destroyed will have to be visited several times to make sure that all seedling bushes have been found and destroyed. During the 1930 field season intensive survey was carried on in nine counties of northwestern Iowa. Besides this, some work was conducted in scattered areas over the State where bushes had been reported and where requests had been made for their removal. A total of 8,117 bushes and 17,042 seedlings was found and destroyed in this period of time. Since the campaign began in Iowa in 1918, 1,075,406 bushes and seedlings have been destroyed.

The educational phase of our campaign is being stressed more and more each year. It has become evident that a successful completion of the barberry eradication work in this State can be brought about only after the people of the State have enlisted in the campaign and shown their willingness to cooperate with the Federal Government. To obtain this cooperation it is necessary to get our subject before the people of the State and teach them the characteristics of this bush and the part it plays in the life cycle of black stem rust. Through our educational program we are endeavoring to do this.

In our educational work, extensive use is made of fair exhibits, window displays, roadside demonstrations, circulars, and bulletins. Talks which are supplemented with lantern slides and

illustrated charts serve, too, as a medium through which to reach the general public.

The schools have served as a valuable channel through which to teach this subject to the boys and girls of Iowa. Each year an endeavor is made to meet the students in as many schools as possible and to teach them about the barberry and its relationship to black stem rust.

When meeting with boys and girls we endeavor to teach them three things.:

- (1) How the barberry plays a part in the spread of black stem rust.
- (2) How to identify this rust-spreading bush.
- (3) Why every bush must be destroyed.

Boys and girls can be of service to our campaign by:

- (1) Telling others about the barberry and black stem rust.
- (2) Reporting to the State office any properties on which barberry bushes are growing.

During the past summer we destroyed a large number of bushes that had been reported to us by boys and girls who had learned about this condemned shrub through some phase of our educational program.

During the 1930 field season a circular letter and some educational material was sent to each property owner and tenant in the counties where we were carrying on the actual survey. News and feature stories were run in some of the daily and weekly newspapers and periodicals of the State. Educational material was distributed to the rural and city schools of fifteen counties in northwestern Iowa. The subject of barberry eradication and black stem rust was discussed at faarm bureau weed meetings, 4-H boys and girls club camps, Smith-Hughes agricultural classes and assemblies of boys and girls in many Iowa high schools. Demonstrations were held at the Iowa State Fair, the Waterloo Dairy Cattle Congress, and at county fairs at Spencer, Humboldt, Rock Rapids, Orange City and Sibley, Iowa.

Each summer during the growing season a fairly accurate check is made of the stem rust developments over the State. Information obtained from this rust survey work is valuable in locating areas of barberries and in determining the sources of the infection whether of local origin or wind blown from other barberry infested areas. The severity and prevalence of the rust infection can also be used to estimate the percentage of rust loss each year.

In the past, experiments have been conducted on methods of chemical eradication. Through the experiments it was found that common salt applied to the base of the bushes was the cheapest and most effective means of destroying barberry bushes.

ORGANIZATION AND FINANCE

The barberry eradication campaign in Iowa is carried on under the supervision of the Office of Barberry Eradication, Bureau of Plant Industry, United States Department of Agriculture, and is directed by a Leader who is an employee of that office. An assistant leader is employed during about six months of each year to assist with the supervision of the field forces and to carry on educational activities, which are a part of each yearly program. Twenty-two field men were employed in Iowa during the summer of 1930.

Funds appropriated by the Federal Government through the United States Department of Agriculture are used to finance this campaign. The State Department of Agriculture, through the office of the State Entomologist, gives valuable aid by inspecting nurseries for harmful barberries and by assisting in the removal of bushes in different localities throughout the State. Indirect aid in the form of office space, heat, light, storage and greenhouse facilities is furnished by the Iowa State College. The plant pathology department, the visual instruction service, and the extension news service at Iowa State College also aid materially in furthering the work. Each summer the county extension agents cooperate closely with our field men in the counties where the actual survey work is being conducted.

The Conference for the Prevention of Grain Rust, a private organization composed of individuals and business groups interested in the production of a better quality of small grains, furnishes valuable aid to the work in Iowa each year through their Minneapolis Office.

TRAINING FIELD PERSONNEL

That old saying that a chain is as strong as its weakest link applies well to our field organization. We are just as strong as our weakest men in a literal sense. Because of this we endeavor each year to pick able and competent men to carry out our program of survey.

For the purpose of injecting new life and experience into our organization we welcome a turnover each year of a few old men. A large list of applicants is considered each spring to fill the vacancies left by old men who have resigned from barberry eradication work to enter other fields.

Men applying for this work are required to study the subject matter pertaining to barberry eradication and related subjects. During the spring regular classes are held once a week for a period of about five weeks at which time the subject matter is discussed in detail. These classes consist of lectures, discussion groups and question and answer groups as the case might be. Each applicant is required to write a competitive examination on this subject matter, which serves as a means to select our men. Other things being equal the men who rate highest in this examination are picked for the vacancies.

Just previous to the time that the men leave for the field a two-day conference and school is held. At this time problems of survey and field procedure are taken up in detail. Since this training of our field men has been started we find them better qualified to meet with the problems that arise in the field and our organization as a whole is a better one.

PROBLEMS OF SURVEY AND ERADICATION

The barberry eradication campaign in Iowa has resolved itself into one of a super-intensive type. Consequently, the densely timbered areas and thickets along streams must be carefully checked. This is a laborious task and one that will take much time. Many bushes growing in out-of-the-way places tax the

COMMON SALT KILLS BARBERRY BUSHES AND PREVENTS SPROUTING



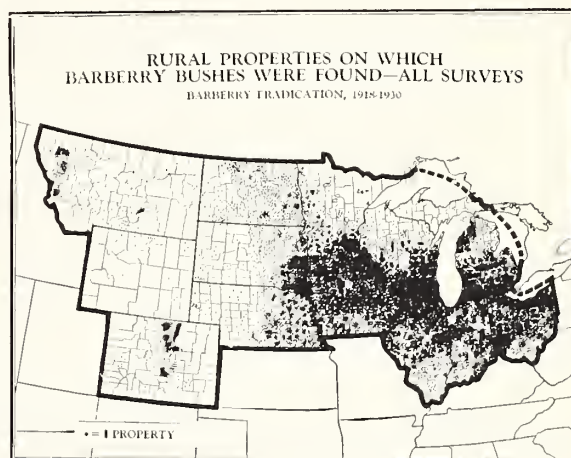
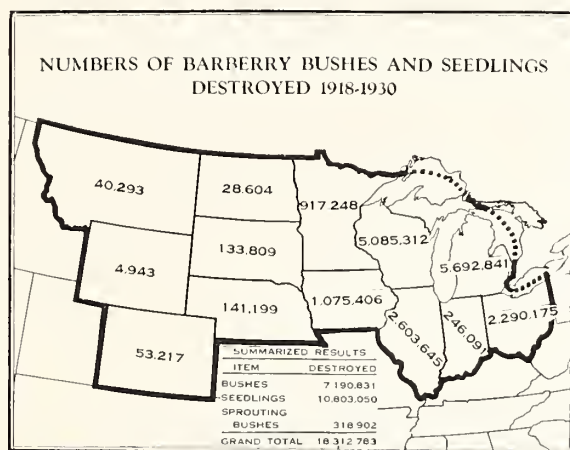
SALTING A BUSH



SPROUTS FROM DUG BUSH

Birds, animals and man chiefly are responsible for the wide distribution of the seeds of common barberries. Every fence row, thicket, pasture or wood is a possible hiding place for these bushes.

Every man, woman and child should consider it his or her duty to look for and report common barberry bushes.



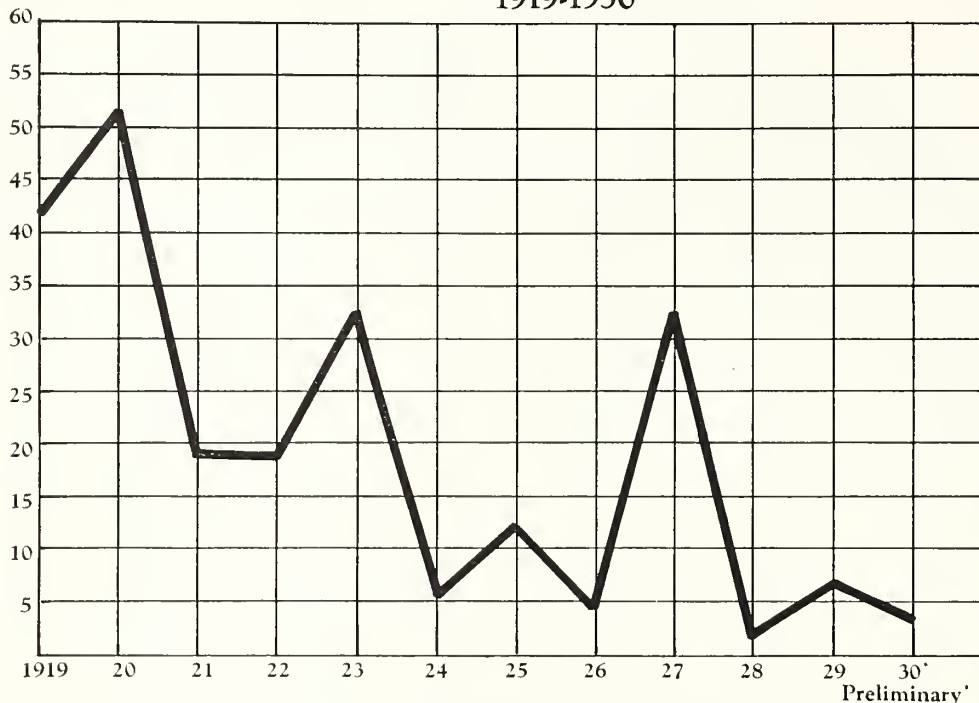
More than 18 million sources of black stem rust
were removed 1918-30

Prepared by the Rust Prevention Association, 300 Lewis Building, Minneapolis, Minn., in co-operation with Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D.C.

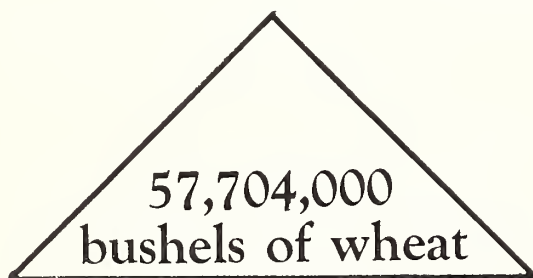
Barberry Eradication Pays

In Millions
of Bushels

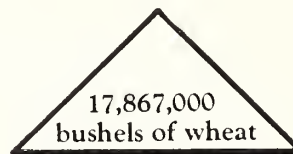
Wheat losses in Barberry Eradication Area
1919-1930



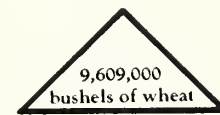
The losses to small grain crops caused by black stem rust have been reduced since the beginning of the barberry eradication campaign in 1918. The breeding of rust-resistant varieties, the use of early maturing varieties, and the sowing of crops early, have aided in this reduction.



Average annual loss
five-year period
1916-1920



Average annual loss
five-year period
1921-1925



Average annual loss
five-year period
1926-1930

Millions of bushels of oats, barley and rye also are
damaged each year by black stem rust

Rust shriveled grain always is discounted

Destroy all Common Barberries—Reduce Losses from Stem Rust.
Receive the Highest Available Price for Grain.

ability of the agent and make hard and fast survey methods imperative.

Every effort must be made as soon as possible to destroy known locations of bushes that are each year producing seeds. In localities where large fruiting bushes have been destroyed, a careful check must be made every few years to find any bushes that may have grown from seeds lying dormant in the ground at the time of the first survey.

FUTURE CAMPAIGN PLANS

The purpose of the barberry eradication campaign, which is being carried on in the thirteen North-Central States, is to reduce the number and severity of destructive stem-rust epidemics, thus decreasing the average annual losses from this disease. To do this our forces must be concentrated in the areas where the most small grain is grown. We have also to consider this work from the standpoint of the thirteen States. Iowa barberries that are a menace to other States should be given attention. Although many parts of the State can not be worked for a few years, any known plantings of these areas should be cleaned up each year. This program will ultimately result in the removal of the greatest number of bushes and it also seems to be the shortest route to an immediate reduction of rust losses.

The special emphasis on the educational phase of the work must be continued in the future. The successful completion of this important work in Iowa can be brought about only after the people of the State have enlisted their services with the United States Department of Agriculture.

CONCLUSION

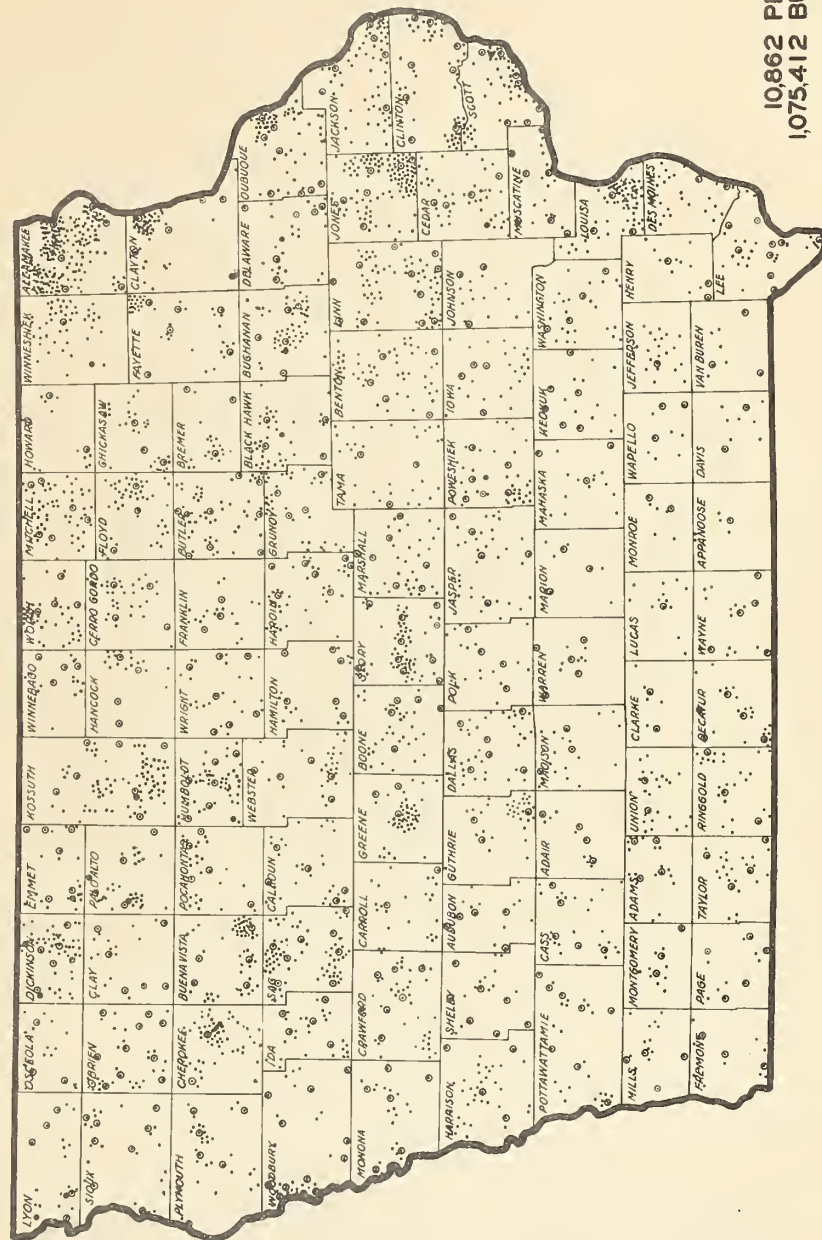
Black stem rust during favorable years attacks and causes heavy losses in our wheat, oats, barley, and rye crops in Iowa. In order to live throughout the year and from year to year in Iowa, the stem rust fungus must spend a part of its life cycle on its alternate host, the common barberry.

The elimination of more than one million barberries during the past twelve years has brought about a decided decrease in black stem rust losses of wheat, oats, barley, and rye.

Barberry eradication is a necessary crop sanitation measure to prevent future severe local epidemics of black stem rust. Every citizen can be of assistance in furthering this work by reporting known locations of harmful barberry bushes to the Office of Barberry Eradication, Morrill Hall, Ames, Iowa.

PROPERTIES HAVING BARBERRY BUSHES 1918-1930

IOWA



10,862 PROPERTIES
1,075,412 BUSHES

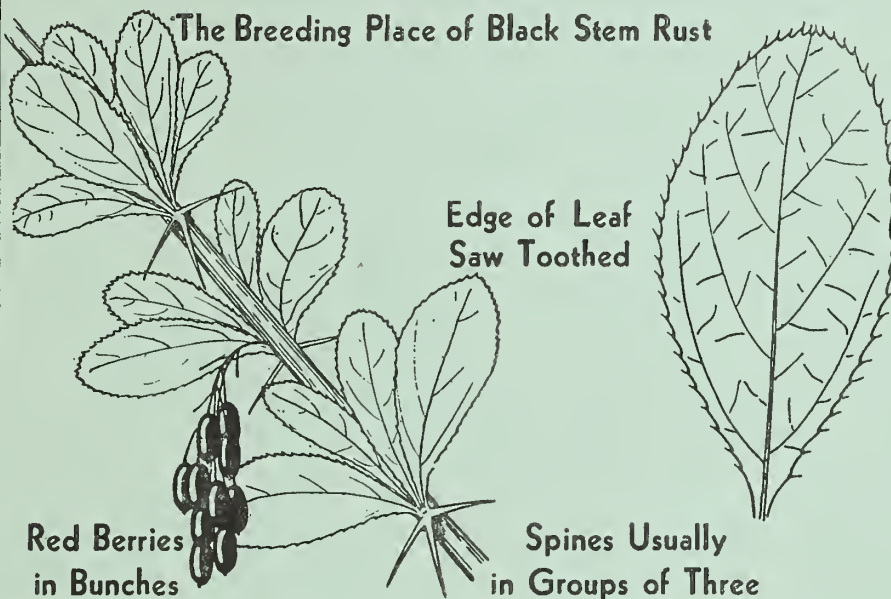
FARMS HAVING BARBERRY BUSHES
TOWNS HAVING BARBERRY BUSHES

Common Barberry Spreads Black Stem Rust

COMMON BARBERRY

HARMFUL

The Breeding Place of Black Stem Rust



Red Berries
in Bunches

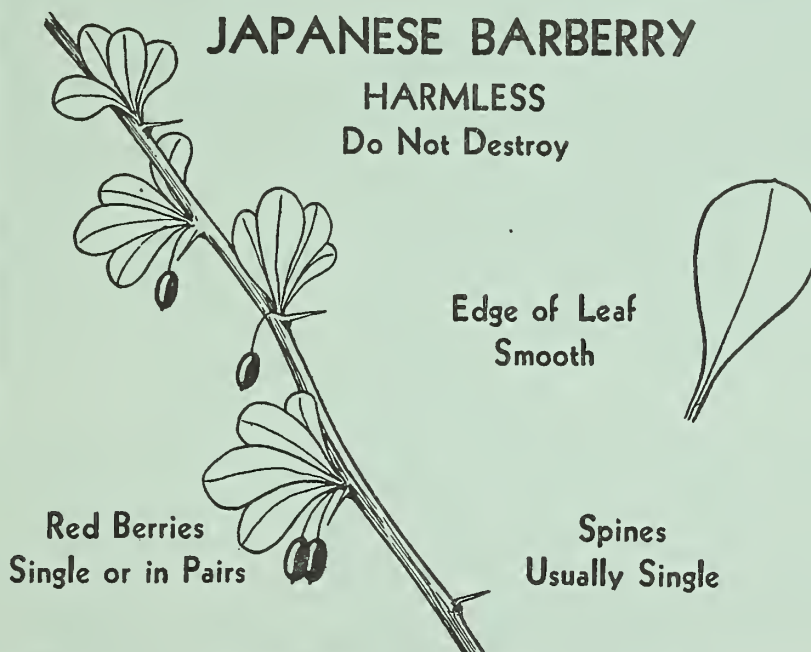
Edge of Leaf
Saw Toothed

Spines Usually
in Groups of Three

JAPANESE BARBERRY

HARMLESS

Do Not Destroy



Red Berries
Single or in Pairs

Edge of Leaf
Smooth

Spines
Usually Single

Look For and Report All Common Barberry Bushes
To the State Leader of Barberry Eradication, in care of your State Department of Agriculture or your State Agricultural College.

Common Barberry Bushes

spread

Black Stem Rust

to

WHEAT, OATS,
BARLEY, RYE,
and Many Wild
Grasses

THIS Progress Report is prepared and printed by the Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C. The cover is furnished by the Conference for the Prevention of Grain Rust, 300 Lewis Building, Minneapolis, Minnesota.